

# JOHN COLLINS ENGINEERS, P.C. TRAFFIC-TRANSPORTATION ENGINEERS

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#### MEMORANDUM

DRAFT

TO:

Mark Edgall, P.E.

FROM:

Philip J. Grealy, Ph.D., P.E.

DATE:

April 2, 2003

RE:

Meadowbrook Estates

Town of New Windsor/Town of Cornwall, New York

PROJECT: No. 676

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The following is our initial technical review of the Traffic Impact Study contained in the RAF dated December 20, 2002 for the above referenced development prepared by Tim Miller Associates, Inc.

- NYSDOT for their review. Comments from the NYSDOT should be obtained.
- 2 o It appears that the Project has been reduced from some 181 single family homes to some 90 single family homes which is addressed in the Traffic Study.
- The EAF addressed the "Five Corners" intersection in Appendix "F". This Appendix was missing from our document and had subsequently been forwarded to our office. It should be confirmed that Appendix "F" was forwarded to the NYSDOT.
- 4 o The Existing Traffic Volumes appear reasonable.
- 5 o The Existing traffic volumes were grown by an appropriate background growth rate of 2% per year to a 2005 Design Year. Would a Design Year of 2007/2008 be more appropriate?

- o Traffic for other proposed developments in the area was included as part of the No-Build Condition including traffic for The Reserve. However traffic for the recently approved Hannaford Supermarket was not included. A sensitivity analysis to include traffic for the Hannaford Supermarket should be provided. This may be significant for the Route 94 and Meadowbrook Road (East) intersection.
- o Access to the project is proposed to Meadowbrook Road (via Route 94) and through The Reserve. It appears by the site distribution figure (Figure 8) that 45% of the traffic will arrive and depart through The Reserve with 25% via Mt Airy Road and 20% via a new roadway (Independence Drive). Noting the above, the following should be considered:
- Based on the review of the existing roadway network and existing traffic volumes, the 45% to/from Bethlehem Road appears to be high. Confirmation of the arrival and departure patterns should be provided. Depending on this information, a sensitivity analysis may be necessary assuming more traffic to/from the Meadowbrook Road access (Via Route 94).
- Assuming the 45% through The Reserve, the time frame for the completion and opening of the new roadway may be critical, especially since the Design Year for the Meadowbrook Estates project is 2005. Depending on the time frame of The Reserve and the time frame of the new roadway, a sensitivity analysis assuming all site traffic utilizing Meadowbrook Road may be required.
- 10 o Also, there the potential for some of The Reserve traffic to access Route 94 through Meadowbrook Estates. A sensitivity analysis should be conducted assuming more traffic to/from the Meadowbrook Road access (Via Route 94).

- Meadowbrook Road (East) currently intersects Route 94 at an acute angle. The Applicant is proposing to realign the Meadowbrook Road east approach to improve current conditions. Based on the information provided, it appears that acceptable sight distance will be provide at the reconfigured Route 94/Meadowbrook Road (East) intersection with the proposed realignment of this intersection. The final configuration of this intersection will have to be reviewed with the NYSDOT.
- o Traffic Study indicates that the improvements to the intersection of Route 94 and Mount Airy Road/access to the Cornwall High School are anticipated to be in place prior to the opening of the High School.
- o The Traffic Study indicates that a separate left turn lane on Route 94 into Meadowbrook Road (East) would not be required.

  However, in consideration of the above distribution comments and additional traffic growth comments, the left turn lane requirement may have to be re-evaluated.
- o The Traffic Study indicates that the Route 94/Jackson Road intersection will operate at a Level of Service "F" with and without the proposed development. The Traffic Study also indicated that to improve the operation of this intersection, a traffic signal would be required under future conditions. This intersection should be monitored in the future to determine if traffic signal warrants will be met. In addition, depending on the above distribution comments and additional traffic growth comments, this intersection may have be re-evaluated.

- 15 o As an editorial comment, on page 15 under heading 5.2 Build Level of Service, the opening sentence of "the proposed Meadowbrook Estates will be contributing 19 trips in the AM Peak and 24 trips in the PM peak" is unclear. Does this refer to the Route 94 and Meadowbrook Road (west) intersection. As noted on Table 8, the Project will generate a total of 73 AM trips and 97 PM trips to the area roadway network.
- o Figure 10 should show the Site Generated PM Peak Hour Traffic not the Build PM Peak Hour Traffic.

The above comments need to be addressed before we can finalize our review.



# STATE OF NEW YORK DEPARTMENT OF TRANSPORTATION 4 BURNETT BOULEVARD POUGHKEEPSIE, N.Y. 12603

ROBERT A. DENNISON III, P.E. REGIONAL DIRECTOR JOSEPH H. BOARDMAN COMMISSIONER

May 15, 2003

Mr. James Petro, Chairman Planning Board Town of New Windsor 555 Union Avenue New Windsor, New York 12553-6196

Re:

Draft Environmental Impact Statement

Meadowbrook Estates

Town of Cornyall/Town of New Windsor

Orange County

Dear Mr. Petro:

We have completed our review of the traffic and transportation impacts contained in the Draft Environmental Impact Statement for the referenced project and have the following comments to offer:

- 1) The methodology utilized in the traffic impact study including the existing traffic volumes, trip generation rates, trip distribution rates, 2% growth rate, no-build traffic volumes and resulting build traffic volumes is acceptable.
- 2) The Department is currently working on improvements to Route 94 (PIN 804110, from Reily Rd. to Rte. 32) within the vicinity of the referenced project. We suggest that Mr. Martin Evans of our Design Group (845-431-5865) should be contacted to incorporate any changes to the Department's plans as part of this project
- Elimination of the existing Old Route 94 West/Route 94 intersection, realignment of Old Route 94, safety related issues and the proposed location of realigned access to Route 94 would be reviewed by our Traffic Engineering and Safety Group as part of highway work permit process.
- We would like to remind you that a State Highway Work Permit will be required for any curb cuts and/or work within the Route 94 right-of-way. An application and final site plans should be forwarded to this Department's local residency office, as soon as possible to initiate the review process.

If you have any questions or need additional information, we can be reached at (845)431-5793.

Very truly yours.

Akhter A. Sharcef

Senior Transportation Analyst

Attachment B SENSITIVITY ANALYSIS

#### ATTACHMENT B

### Sensitivity Analysis Assumed Conditions

The Sensitivity analysis considered the cumulative effect of three changes in the traffic analysis volumes as described below:

- 1. Additional two percent per year for three years to 2008.
- 2. Additional No Build traffic from Hannaford Supermarket and Five Corners' area.
- 3. Increased traffic at the access to NYS Route 94 equivalent to rerouting all site traffic to/from Bethlehem Road toward NYS Route 300 via Five Corners. Reserve traffic going through the site is balanced by site traffic going through the Reserve development.

Traffic volumes for the sensitivity analysis including No Build, site distribution, site generated traffic, Build Condition are shown in Attachment C using the figure numbers corresponding to the EAF figures.

### Sensitivity Analysis Results

Table 1 shows the resultant levels of service for the Build condition assuming the above sensitivity changes.

Mount Airy/NYS Route 94 signal timing in the AM peak would need to be adjusted to address additional through traffic to maintain D or better. The PM peak hour remains level of service C or better.

NYS Route 94 Meadowbrook East (old Route 94) southbound level of service declines one service level compared to the Build Condition. The AM peak hour level of service C becomes D and the PM peak hour level of service D goes to E.

NYS Route 94 Meadowbrook West (old Route 94): no change in level of service from the Build Condition.

NYS Route 94/Jackson Avenue intersection had level of service F in No Build without additional traffic. The redistribution of site traffic does not add any site traffic to this intersection. If signalized, mitigation for AM peak hour would remain unchanged at level of service B. The PM peak hour would be level of service C or better. Additional green time for through movement would compensate for additional through traffic.

Bethlehem Road /Mt Airy: This was level of service B or better in the Build Condition. Above analysis assumptions reduce traffic in this location so no further analysis was done.

Orrs Mill Road/Jackson Avenue: no change in level of service between the Build Condition and the Sensitivity Condition.

Level of service calculations are shown in Attachment D.

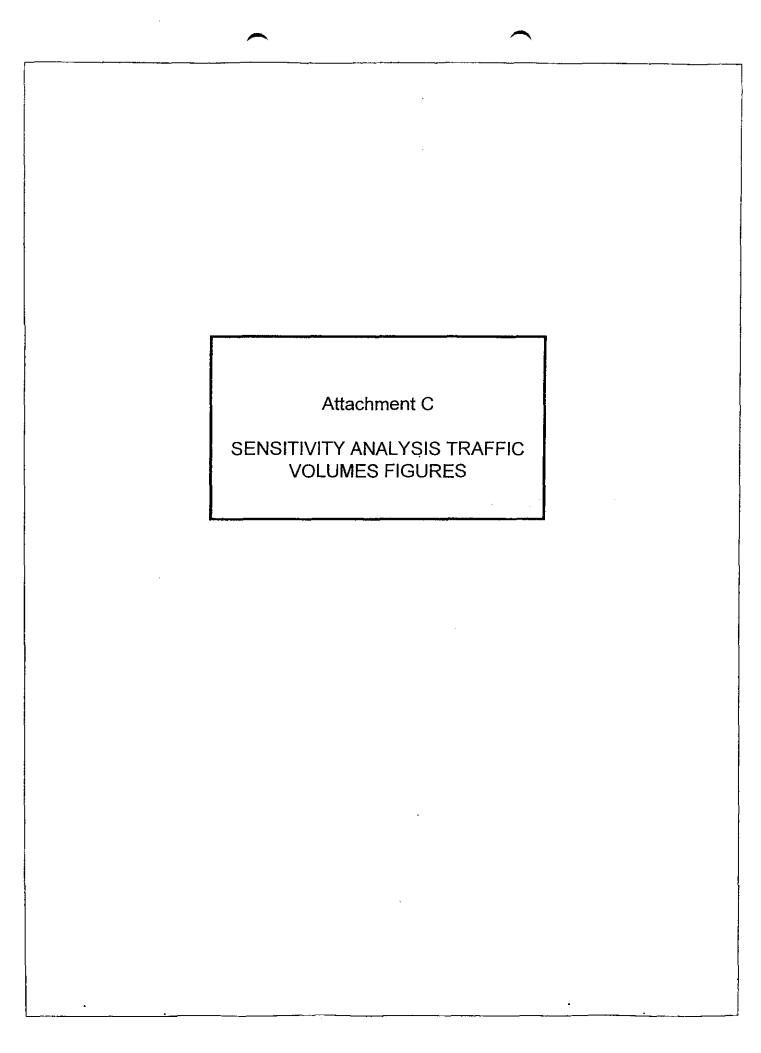
	nsitivity Analysis	Secretary - Box de proposité prestrativo	No.				
:	Lane Group		ekday Peal	k Hour		ekday Peak	<del></del>
Intersection Roads	(Approach Direction -Movement)	Volume to Capacity Ratio	Delay seconds/ vehicle	Level of Service	Volume to Capacity Ratio	Delay seconds/ vehicle	Level of Service
Mount Airy Road &	NYS Route 94						
NYS Route 94	EB-L	0.04	9.9	Α	0.58	28.4	C*
	EB-TR	0.96	47.1	D*	0.65	15.1	В
NYS Route 94	WB-L	0.87	51.1	D*	0.26	10.9	B*
	WB-TR	0.52	18.4	В	0.89	26.2	C*
Mt. Airy HS Drive	NB-LTR	0.54	29.9	С	0.71	27.4	С
Mt. Airy Road	SB-LTR	0.85	54.1	D	0.74	31.7	С
	Total		40.3	D*		23.5	C*
NYS Rt. 94 & Meado	wbrook Rd (East)						" <del>-</del>
NYS Route 94	EB-LTR	0.01	8.2	А	0.02	9.5	Α
	WB-LTR	0.00	9.3	Α	0.00	8.8	Α
Meadowbrook Rd.	NB-LTR	0.02	16.6	С	0.01	21.4	С
	SB-LTR	0.27	26.7	D*	0.30	42.1	E*
NYS Rt. 94 & Meado	owbrook Rd (West)						
NYS Route 94	WB-LT	0.00	9.0	Α	0.01	8.8	Α
Meadowbrook Rd.	NB-LR	0.07	22.2	С	0.03	14.1	В
Orrs Mill Road & Ja	ckson Avenue						
Orrs Mill Road	EB-LTR	0.01	7.7	Α	0.02	8.2	Α
	WB-LTR	0.00	7.9	Α	0.00	7.5	Α
Jackson Avenue	NB-LTR	0.10	13.3	В	0.15	14.9	В
	SB-LTR	0.54	21.2	С	0.41	18.9	С
NYS Rt. 94 & Jacks	on Ave. (w/ signal)						
NYS Route 94	EB-LTR	0.72	17.2	В	0.73	14.3	В
	WB-LTR	0.47	11.8	В	0.76	14.7	В
Jackson Avenue	NB-LTR	0.30	16.2	В	0.59	26.9	C*
	SB-LTR	0.44	18.4	В	0.50	23.5	C*
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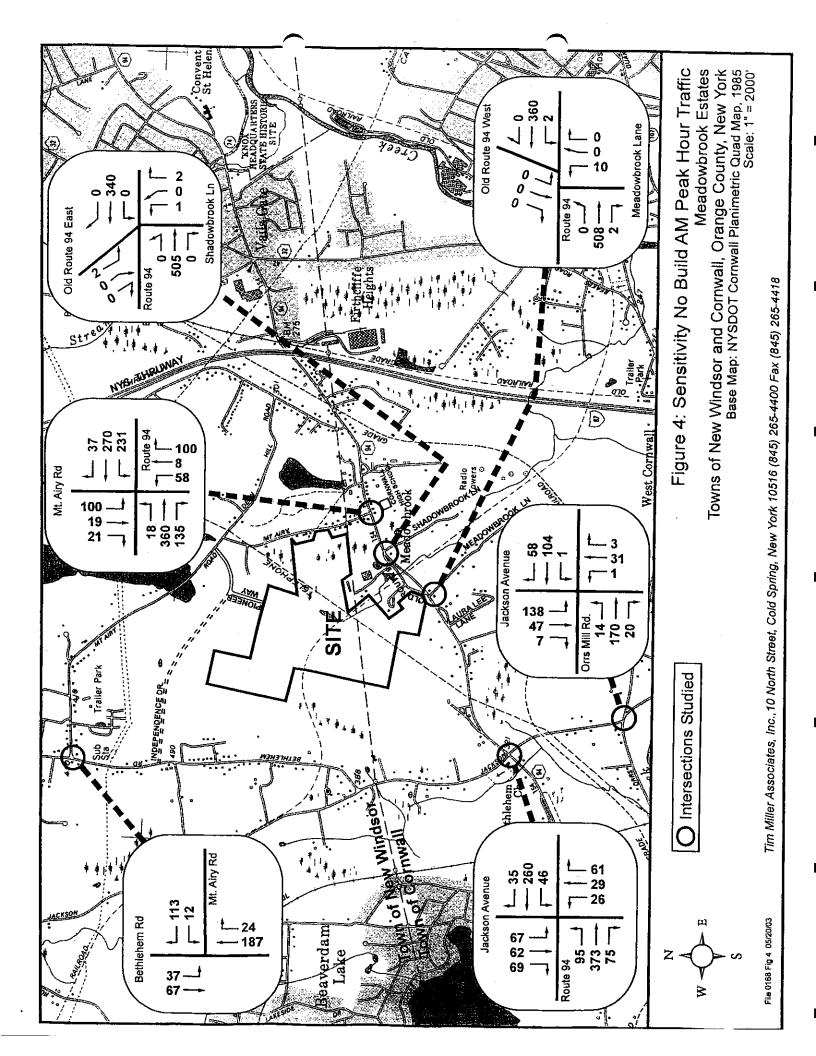
NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound

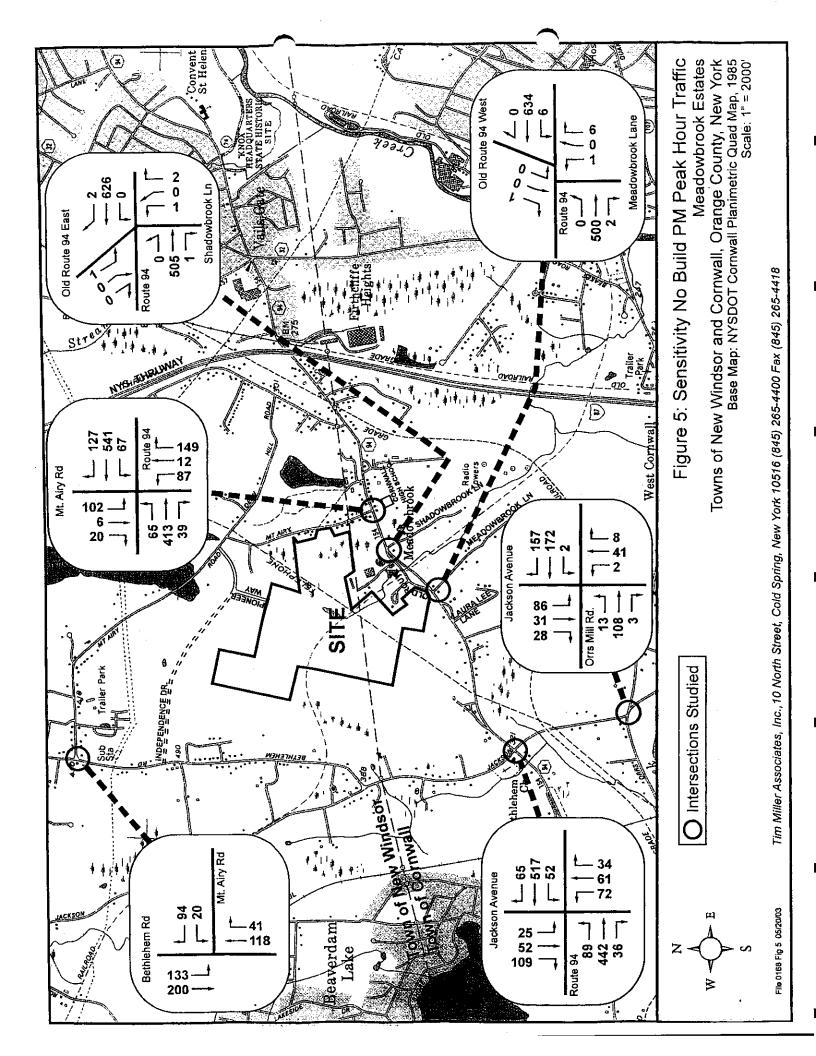
Italics denotes signalized intersection.

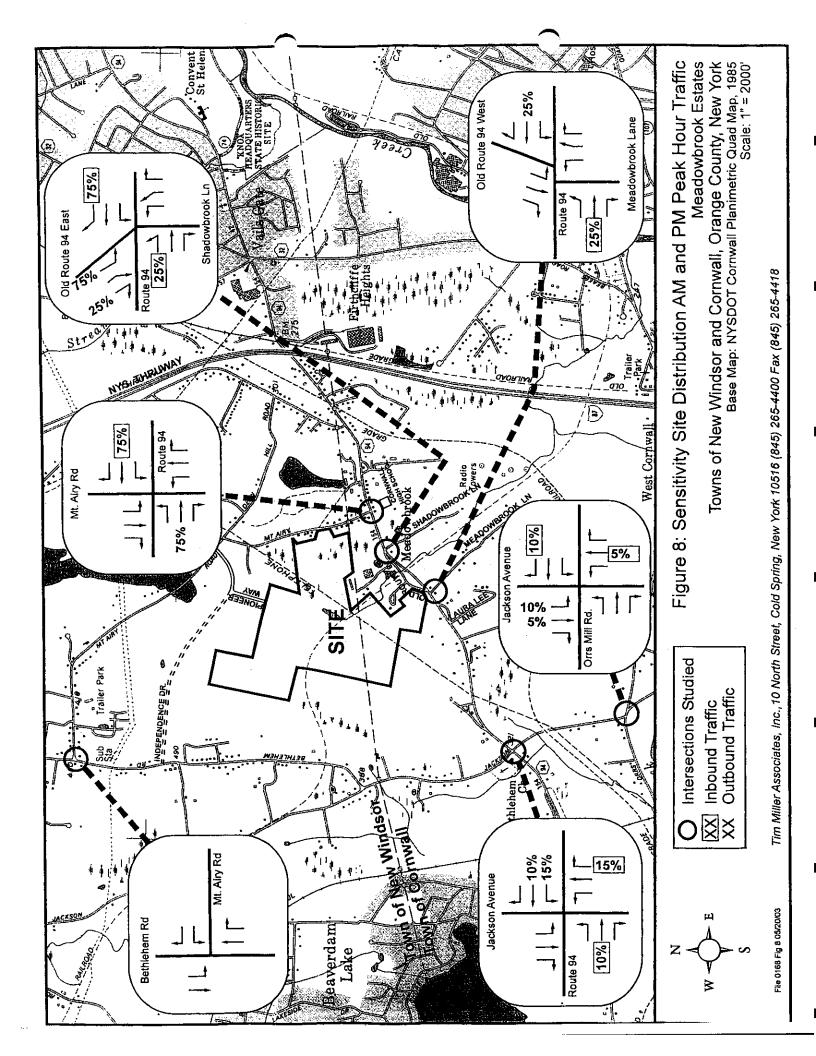
L = left, R = right, T = through, TR = through and right, (e.g. WB-L = Westbound left).

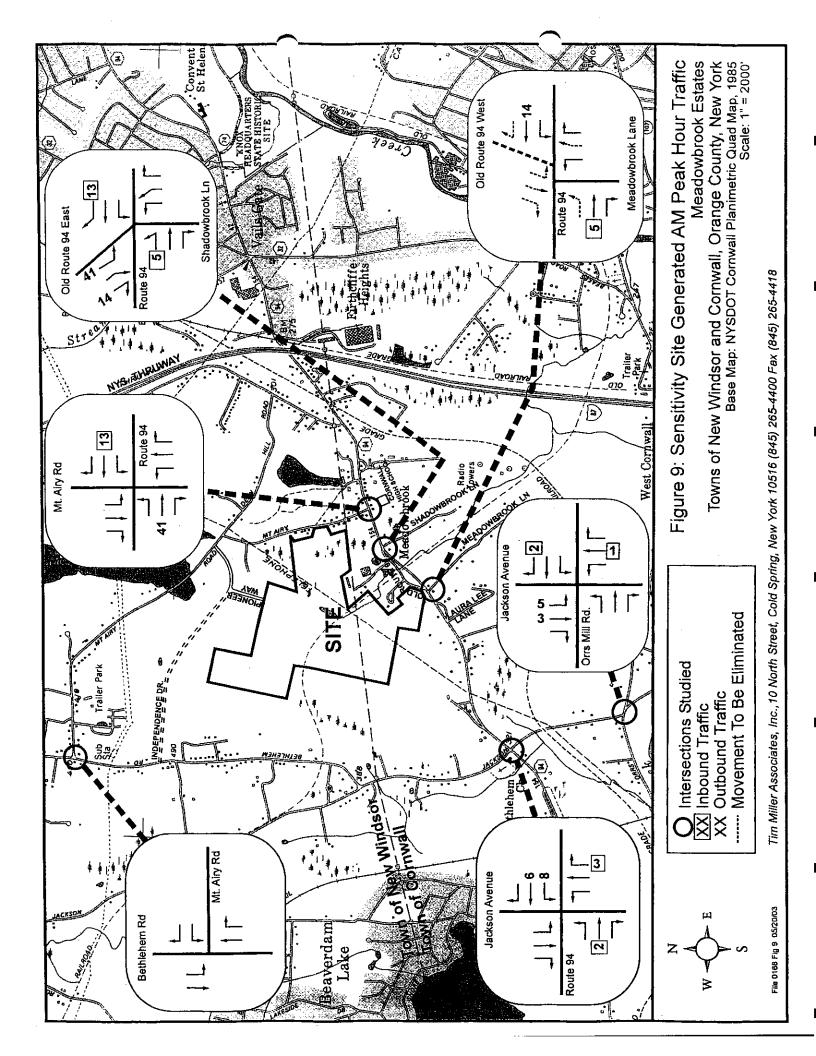
<sup>\*</sup> Indicates a decline in the level of service from Build Condition.

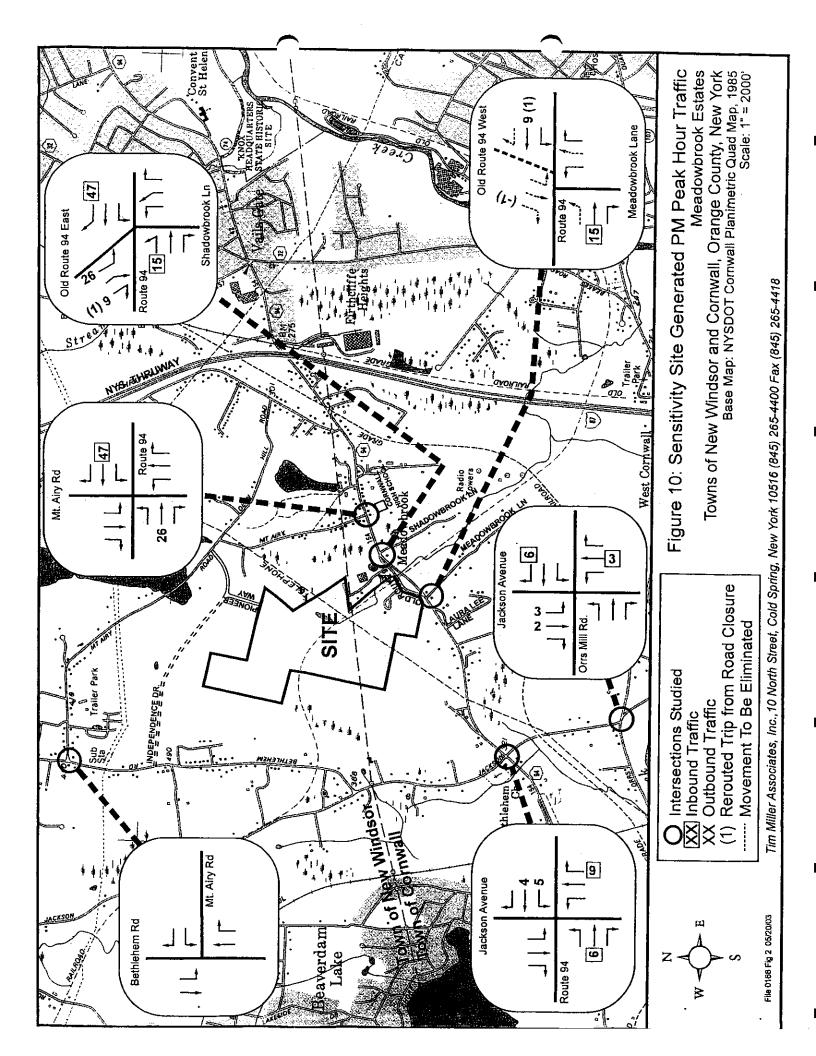


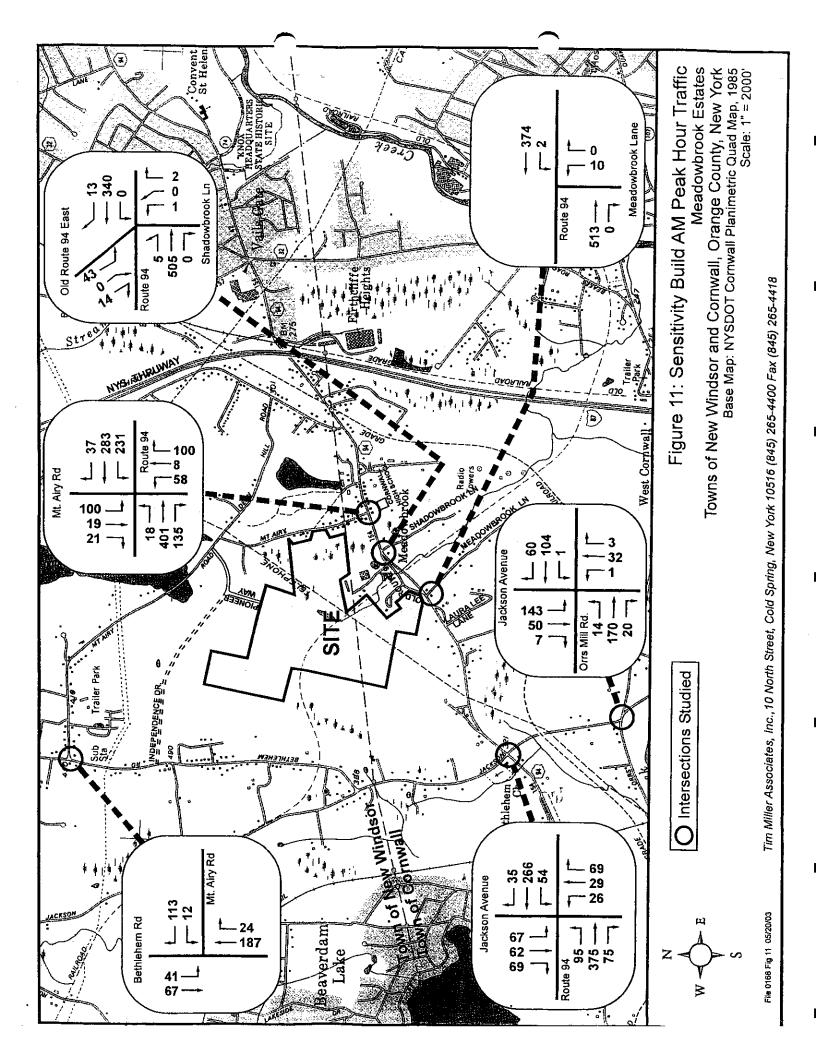


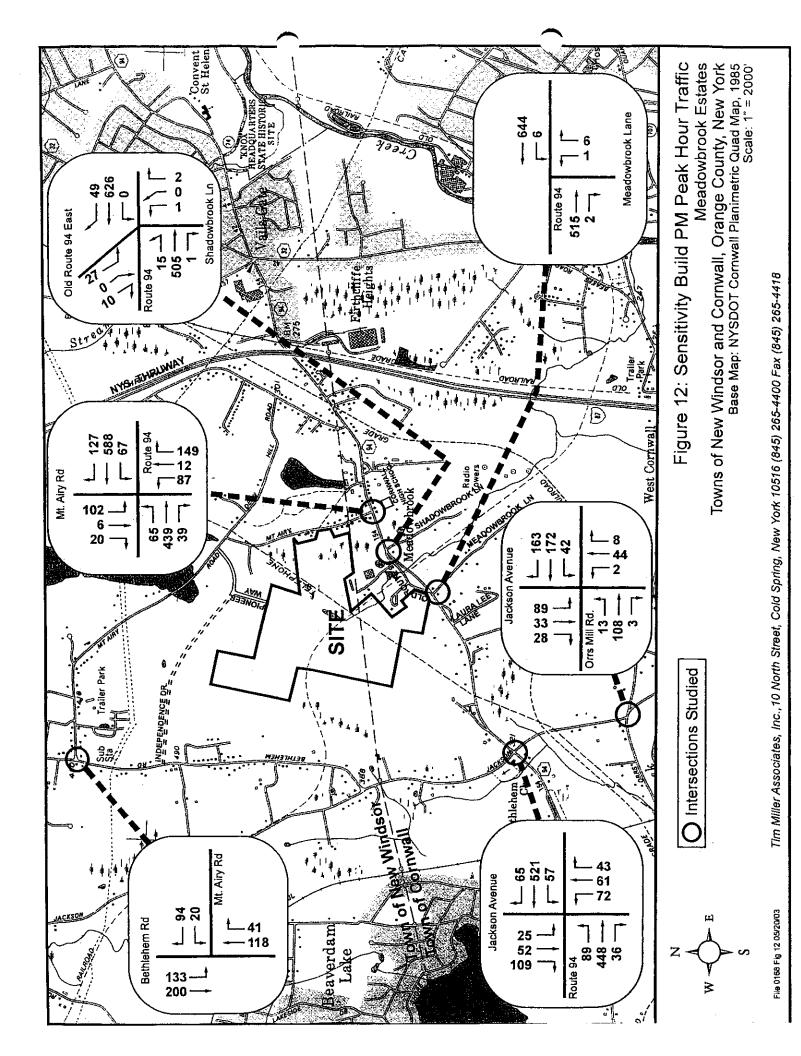


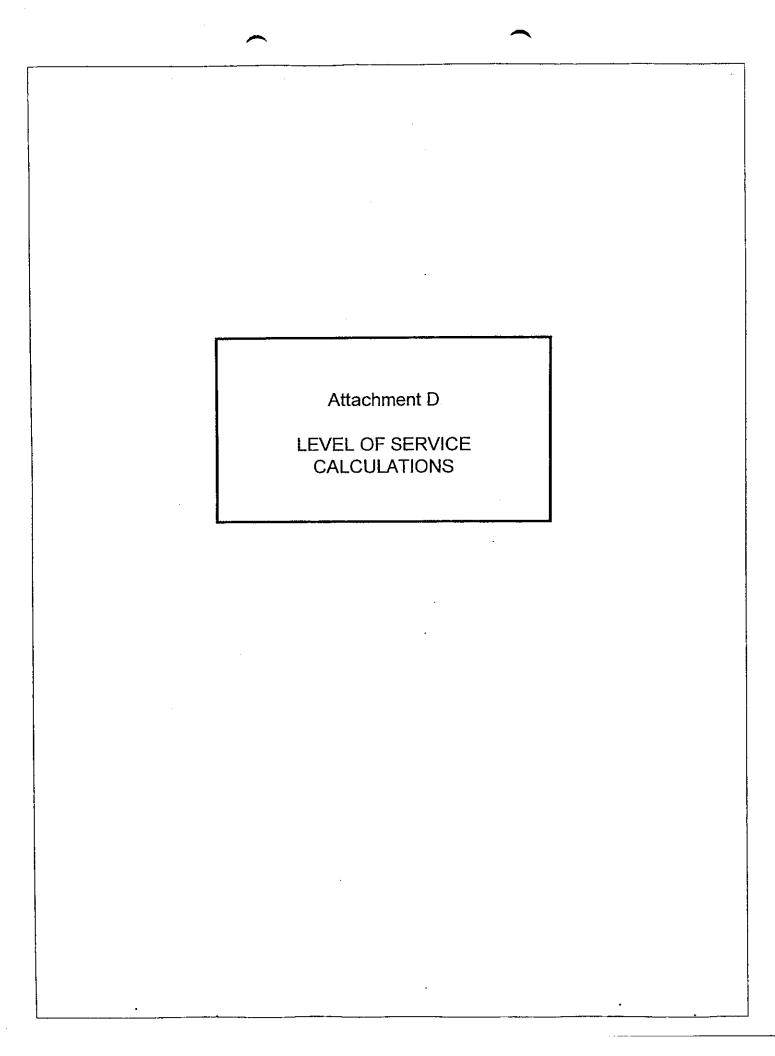












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	TWO	-WAY STOP	CONTR	ROL S	UN	MARY			<del></del>
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Analysis Time Period	AM Peak	Hour	Analy	sis Ye	ar		Build Se	nsitivity	
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Median Type				Undiv	ide	<u>d</u>	···		
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C (m) (vph)	1122	842		318				227	···
v/c	0.01	0.00		0.02				0.27	<del>                                     </del>
95% queue length	0.02	0.00		0.07				1.07	
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	TWO	-WAY STOP	CONTR	OL S	SUN	MARY				-
General Information	n	·	Site	Infor	mat	ion				
Analyst	JAG		Inters	ection			Rt 94 &	Mead	lowbr	ook
Agency/Co.	TMA		¬∥—				West			
Date Performed	5/20/03	<u> </u>	, , , , , , , , , , , ,	liction		<del></del>	Town of			
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Project Description Me		states	N t = -41s	0	24	-1. 11				
East/West Street: Route							dowbrook .	Road		
ntersection Orientation:			Study	renoc	7m	s): 0.25				===
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Percent Heavy Vehicles	0		1 -			0	420			
Median Type	<u> </u>	<del></del>		<u>Undi</u> v	/ide			\		
RT Channelized			0	Unun	700	<u> </u>	Γ			0
_anes	0	1	0			0	1			0
Configuration			TR			LT	<del>                                     </del>			<u> </u>
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Minor Street			<del>.' _</del> ====					und	<del></del> -	
Movement	7	Northbound 8	9	─		10	Southbo 11	una T		12
MOVELLICITY		T	R			 	<del>  '</del>			
Volume	10	0	0			1	1			R 1
Peak-Hour Factor, PHF	0.63	0.63	0.63			0.25	0.25			.25
Hourly Flow Rate, HFR	15	0.00	0.00	·		0.20	0.25			0
Percent Heavy Vehicles	0	0	0		_	0	0			0
Percent Grade (%)		0					0	L		<del></del>
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Lanes	0	0	0			0	0			0
Configuration	<u> </u>	LR	<u> </u>				<u> </u>	<u><u>l</u></u>		
<u>Delay, Queue Length, a</u>										
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Movement	1	4	7	8		9	10	1	1	12
Lane Configuration		LT		LR						
v (vph)		2		15					]	
C (m) (vph)		897		224						
v/c		0.00		0.07	7					
95% queue length		0.01		0.21						
Control Delay		9.0		22.2						
LOS		A.0		C						
Approach Delay				22.2	<u>:                                    </u>					
Approach LOS				C			<u> </u>			

	TWO	WAY STOP	CONTR	OL SU	MMARY			
General Information	n		Site I	nforma	ition			
Analyst	JAG		Inters	ection		Orrs Mill	/Jackson	
Agency/Co.	TMA		Jurisd	iction		Town of	Comwall	
Date Performed	5/20/03		Analy	sis Year		Build Se	nsitivity	
Analysis Time Period	AM Peak	Hour						
Project Description M	adowbrook l	States						
East/West Street: Orrs	Mill Road		North/	South St	reet: Jack	son Avenu	е	
Intersection Orientation:	East-West		Study	Period (h	rs): 0.25			
Vehicle Volumes a	nd Adjustn	nents						
Major Street		Eastbound				Westbo	und	
Movement	1	_2	3		4	5		6
	L	Τ	R		L	T		R
Volume	14	170	20		1	104		60
Peak-Hour Factor, PHF	0.72	0.72	0.72		0.86	0.86		0.86
Hourly Flow Rate, HFR	19	236	27		1	120		69
Percent Heavy Vehicles	4		<u> </u>		11			
Median Type	<u> </u>			Undivid	ed			
RT Channelized	<u> </u>		0					0
Lanes	0	1	0		0	1		0
Configuration	LTR				LTR			
Upstream Signal	<u> </u>		<u> </u>			0	<u>L</u>	<u></u>
Minor Street		Northbound				Southbo	und	
Movement	7_	8	9		10	11		12
	<u> </u>	Т	R		Ł	Т		R
Volume	1	32	3		14 <u>3</u>	50		7
Peak-Hour Factor, PHF		0.71	0.71		0.78	0.78		0.78
Hourly Flow Rate, HFR	1	45	4		183	64		8
Percent Heavy Vehicles	5	5	5		4	4	<u>l</u> _	4
Percent Grade (%)	i	10				-2		
Flared Approach		N				N		
Storage		0				0		
RT Channelized			0					0
Lanes	0	1 1	0		0	1		0
Configuration	<del>                                     </del>	LTR				LTR		
Delay, Queue Length,	and Level of							
Approach	EB	WB	<u> </u>	Vorthbou	nd	S	outhboun	d
Movement	1	4		8	9	10	11	_
<del></del>			7		3	10		12
Lane Configuration	LTR 10	LTR		LTR	<del> </del>	<del></del>	LTR	<del> </del>
v (vph)	19	1		50	<b></b>	<del> </del>	255	<del> </del>
C (m) (vph)	1373	1251		486	<u> </u>		472	
v/c	0.01	0.00		0.10			0.54	<u> </u>
95% queue length	0.04	0.00		0.34			3.16	
Control Delay	7.7	7.9		13.3			21.2	
LOS	Α	A		В		<del>                                     </del>	С	<del> </del>
Approach Delay				13.3	<u> </u>	<del>                                     </del>	21.2	<del>-</del>
Approach LOS			<del> </del>	B		<del> </del>	C	
HCS2000 <sup>TM</sup>		pyright © 2000 Unive	<u> </u>			L	<u> </u>	Version 4.

HCS2000<sup>™</sup>

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		· ·	Н	CS200		ETA	AILED	REP	OR	 T			·			····
General Infor	mation									mation						
Analyst Agency or Co. Date Performe Time Period		ır					,	Interse Area T Jurisdi Analys Projec	ype ction is Y	n 7 ear E	All othe Town or Build Si	14 & Jacks r areas f Cornwall gnal Sens vbrook Est	itivity	ie		
Volume and 1	iming Input		,											7	·	
			LT	EB	TR		LT	WB TH		RT	LT	NB TH	RT	LT	SB	RT
Number of land	es, N <sub>1</sub>		0	1	7		0	1		0	0	1	0	0	1	0
Lane group			:	LTR				LTF	LTR			LTR			LTR	<del>                                     </del>
Volume, V (vp	h)		95	375	7.	5	54	266	266		26	29	64	67	62	69
% Heavy vehic	cles, %HV		0	0	O	)	0	0		0	0	0	0	0	0	0
Peak-hour fac	tor, PHF		0.93	0.93	0.9	3	0.93	0.93		0.93	0.74	0.74	0.74	0.89	0.89	0.89
Pretimed (P) o	r actuated (A)		P	Р	F	>	P	P		P	Р	P	P	P	Р	ρ
Start-up lost til	· · · · · · · · · · · · · · · · · · ·			2.0				2.0				2.0			2.0	
	ffective green, e		<u> </u>	2.0			<u>                                     </u>	2.0				2.0	<u> </u>	<u> </u>	2.0	
Arrival type, A			<u> </u>	3			ļ	3		<u> </u>	_	3			3	
Unit extension	<u> </u>			3.0			ļ	3.			<u> </u>	3.0	ļ		3.0	
Filtering/meter				1.000				1.000			<u> </u>	1.000	<u> </u>	<u> </u>	1.000	<u> </u>
Initial unmet d		···	ļ	0.0	_		ļ	0.0			<u> </u>	0.0	ļ	<b> </b>	0.0	
Ped / Bike / R	TOR volumes		0		0		0			0	0		0	0	<del> </del>	0
Lane width			<u> </u>	12.0	+-			12.0			<del>  -</del>	12.0	1	1	12.0	<b></b> _
Parking / Grad			N	0	^	<i>-</i>	N	0		N	N	-2	N	N	2	N
Parking mane Buses stoppin				0	+		-	0		<u> </u>	+	0	<del> </del>	╁——	-	<b></b>
<del></del>	edestrians, G			3.2			-	3.2		L	+	3.2	1	1	3.2	┸┈┤
Phasing	EW Perm	02	<u> </u>	03		04				Perm	1	06	T (	07	0.2	8
Timing	G = 30.0	G=		G=			) =	G = 2		20.0	G					
	Y = 5	Y =		Y =		Υ	=	Y = :		5		Y = Cycle Length,		Y =		
	nalysis, T = 0.25 Capacity, Contr	oi Delav	, and L	OS Det	ermin	atio	<u></u>					ycie Lengt	n, C = 0	ov.v		
			E	_		4	W	В				NB		L	SB	_
Adjusted flow	rata v	LT	TH		eT .	LT	T	-	R	Т	LT	TH	RT	LT	TH	RT
Lane group ca			586	_	$\dashv$		38		-			160		<del> </del>	223	+-
v/c ratio, X	macity, 6	+	812 0.72	_	-		81 0.4		-		<del></del>	535 0.30			506 0.44	<del>                                     </del>
Total green ra	tio. a/C	<del></del>	0.72				0.4		-	+		0.33		-	0.33	<del>  </del>
Uniform delay		+	11.7	-	_		9.			-		14.8		<del> </del>	15.6	+
Progression fa	<del></del>		1.00	<del></del>			1.0			$\dashv$		1.000		<del>                                     </del>	1.000	+
	elay calibration, k 0.50						0.5			$\dashv$		0.50	<u> </u>	<del> </del>	0.50	<del>                                     </del>
Incremental de	remental delay, d <sub>2</sub> 5.5						2.0			$\neg \dagger$		1.4			2.8	+
Initial queue d														<u> </u>	1	
Control delay			17.2	?			11.	8				16.2			18.4	
Lane group L0	ane group LOS B					В					В			В		
Approach dela	зу		17.2				11.8				16	.2		18.4		
Approach LOS	8		В				В				E	3			В	
Intersection de	elay		15.8							Ir	ntersec	tion LOS			В	
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			Н	CS2	000	DET.	AILE	D F	REP	OR	Ť					<del></del>	
General Infor								S	ite In	forn	nation						
Analyst Agency or Co. Date Performe Time Period		r						A Ji A	nterse rea T urisdi nalys roject	ype ction is Y	n 7 ear <i>B</i>	ll othe own o uild S	Road & R r areas f Cornwall ensitivity vbrook Esi				
Volume and T	iming Input		<del></del>												E	<del></del> -	
		.,	F	El					WB				NB			SB	
Number of lane	e N		LT 1	T		RT 0	1		T}-   1		RT 0	LT	TH	RT	+LT	TH	RT
Lane group	33, 14,		1	17					TR		-	+-		0	0	1	0
Volume, V (vpt			<del></del>	-		20	+		+	_	407	+-	LTR	<del> </del>	<del>                                     </del>	LTR	<del></del>
% Heavy vehic	<del></del> _		65 6	43	—+	39	67		588		127	87	12	149	102	6	20
			+	<del>-   `</del>	+	6	10		3		3	20	10	20	6	6	6
Peak-hour fact			0.86	0.8	<u> </u>	0.86	0.92	2	0.92	<u>'</u>	0.92	0.85		0.85	0.53	0.53	0.53
Pretimed (P) o			P	F	—∤	Р	P		P		P	P	P	P	P	P	P
Start-up lost tir	ne, i <sub>1</sub> ffective green, e		2.0 2.0	2.			2.0		2.0		<del> </del>	┼	2.0	┿	┼──	2.0	┼
Arrival type, A			3	3	∤		3		2.0			-	2.0	+	<del> </del>	2.0	
			<b>├</b> ─				<del></del> -		-			┼-		<del></del>	┼	3	
Unit extension Filtering/meter			3.0 1.000	3. 1.0			3.0		1.00		<b> </b> -	+-	3.0	╂	<del> </del>	3.0	<del> </del>
			0.0	0.			0.0	<u> </u>	0.0	_		┼	1.000	┼	┼	1.000	<b>-</b>
Initial unmet de Ped / Bike / R1			0.0	+"	<del>-</del> -{	0	0.0		0.0	_	0	0	0.0	0	10	0.0	+
	ne width				.0		+	11.0				1 "	13.0	+-	+-	10.0	0
	ne width orking / Grade / Parking					N	I N		11.0 -2	_	N	N.	2	- N	l N	-6	N
			N	- 2		· ·	<b>┼</b> ~					<del>  ^</del>	<del>  2</del>	"	<del>  '</del>	<del>  -°</del>	+~-
Parking maneu Buses stopping			0	10	,		10		0			<del>                                     </del>	<del></del>	╂──	├	10	+
Min. time for p			<del>                                     </del>				┿		3.2			┼	3.2	<u></u> .	<del>                                     </del>	3.2	Ь
Phasing	EW Perm	02			03		04	-	١		Perm	<u> </u>	06		07		8
Timing	G = 30.0	G=		G=			G =	_			20.0		=	G=		G =	
-	Y = 5	Y =		Υ =			Y =		1	Y =	5	<u> </u>	=	Y=	00.0	Y≒	
	alysis, T = 0.25 Capacity, Contro	ni Dela	, and l	08/	Patarn	inatio	200						ycle Lengt	n, C = (	0.0		<del></del>
Lane Group C	sapacity, com	T Delay	, <i>and</i> E		, c. c. , , ,	T	<u></u>	WB					NB			SB	
		LT	-		RT	17		Tì		R	T	LT	TH	RT	LT	TH	RT
Adjusted flow		76	55			73		777		_	<b>—</b> ∤		291		<del> </del>	241	<del> </del>
Lane group ca	pacity, c	130			ļ	278		877		<b> </b> _			410		ļ	326	<del></del>
v/c ratio, X		0.58			<b> </b>	0.2		0.8		_			0.71		<del> </del>	0.74	<del> </del>
Total green ra		0.50			<u> </u>	0.5		0.5		_	{		0.33		<del> </del> -	0.33	<del> </del>
Uniform delay		10.6			<u> </u>	8.6		13.		_			17.5	<del> </del>	<del> </del>	17.7	
Progression fa		1.00			<b> </b>	1.00		1.00		ļ			1.000	<u> </u>	<del> </del> -	1.000	<del> </del>
<del></del>	elay calibration, k 0.50 0.50				<u> </u>	0.5		0.5		-			0.50	<del> </del>	<del> </del>	0.50	<del> </del>
<del></del>	cremental delay, d <sub>2</sub> 17.8 3.9 itial queue delay, d <sub>3</sub>				<del>                                     </del>	2.3	<u>'</u>	12.	<u> </u>	├-			10.0	<del> </del>	├	14.0	<del></del>
<del></del>					10.		26.	2	-	<del>-  </del> -		27.4	<del> </del>	<del> </del>	31.7	+	
<u> </u>	<del>~~~~</del>			10.1   B		26.4 C		_			C C	<del> </del>	┼──	C	+		
	<del></del>			24.9	_		<u> </u>		3.	<del></del>	L	<del> </del>		<u> </u>			
Approach LOS		+-	16.7			+	C				-+	27.4 C			31.7 C		
		<del> </del>	B			+-		_						<del>.</del> .	<del> </del>		
Intersection delay 23.5  HCS2000 <sup>TM</sup> Copyright © 2000						2000	Iniversit	v of F	Intersection LOS C of Florida, All Rights Reserved						Version 4.1		

	TWO-\	NAY STOP	CONTR	OL S	UM	MARY			··	
General Information			Site I	nforn	nati	ion				
Analyst	JAG		Interse	ection			Rt 94 & I	Meado	wbro	ook
Analyst Agency/Co.	TMA						East			
Date Performed	5/20/03		Uurisdi				Town of			
Analysis Time Period	PM Peak I	lour	Analys	sis Yea	ar		Build Sei	nsiţivit	<u> </u>	
				<del>- 1</del>			1	****		
. A second secon	adowbrook Es	states	No ab /	2 a 4 b	Ct-o		lavebraale f	2004		
East/West Street: Route						et: <i>Mead</i> s): <i>0.25</i>	OWDIOUK F	toau		<del></del>
Intersection Orientation:			Otudy	CINOU	31013	5). 0.20	<del></del>			
Vehicle Volumes an	d Adjustm		·				144 (1			
Major Street		Eastbound	Т			4	Westbou	ina		
Movement	<u> </u>	<u>2</u> T	3			4	5 T			6 R
	<u>L</u>	<del> </del>	R			0 0	626	-		<del>K</del> 49
Volume	15 0.81	505 0.81	0.81			0.84	0.84			.84
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	18	623	1			0.04	745			.04 58
Percent Heavy Vehicles	3		<del> </del>			3				_
Median Type			<u> </u>	Undiv	/ide/		. <u> </u>			<del></del>
RT Channelized		T	0	01701	7000	<u></u>				0
Lanes	0	1	0			0	1			0
Configuration	LTR	<del>                                     </del>	<u> </u>			LTR			<u>.</u>	
Upstream Signal		0					0			
Minor Street		Northbound					Southbor	und		
Movement	7	8	9			10	11	<u> </u>	-	12
NO CONTON	L	Т	R			L	Т			R
Volume	1	0	2		•	27	0	_		10
Peak-Hour Factor, PHF	0.75	0.75	0.75			0.90	0.90		0	.90
Hourly Flow Rate, HFR	1	0	2			30	0			11
Percent Heavy Vehicles	0	0	0			0	0			0
Percent Grade (%)		1	-				2			
Flared Approach	····	N					N			
Storage		0		T I			0			
RT Channelized	<del></del>		0						•	0
Lanes	0	1	0			o	1			0
Configuration		LTR	† <u>*</u>				LTR		-	
Delay, Queue Length, a	nd Level of S									
Approach	EB EB	WB		Vorthb	ALID	d	S	outhbo	aund	
Movement	1	4	7	8		9	10	11		12
Lane Configuration	LTR	LTR	<u> </u>	LTF			<del>                                     </del>	LTF		1E
v (vph)	18	0		3				41		
	816	952		222			<b></b> -	137		
C (m) (vph)					_					
v/c	0.02	0.00		0.0				0.30		
95% queue length	0.07	0.00		0.04				1.17		<u> </u>
Control Delay	9.5	8.8_		21.4				42.1		
LOS	Α	A		С				E		L
Approach Delay				21.4				42.1	'	
Approach LOS			<u> </u>	С			<u> </u>	E		

	TWO	-WAY STOP	CONTR	OL S	SUM	MARY	<del></del>	·		
General Informatio	n		Site	nfor	mat	ion				
Analyst	JAG		Inters	ection			Rt 94 &	Mead	owbr	ook
Agency/Co.	TMA					<del></del>	West			
Date Performed	5/20/03		Jurisc			<del></del>	Town of			· · · ·
Analysis Time Period	<del></del>	Condition	Analy	<u>sis Ye</u>	ar		Build Se	nsitiv	ity	
				<del></del>			<u> </u>			
	eadowbrook l	states	la a a b a	· · · · · · · ·		-4. 44	t and the second			
East/West Street: Rout Intersection Orientation:				-		<u>еt: меас</u> s): 0.25	lowbrook i	Road		
			Study	renuc	1 (1)13	5). 0.23				
Vehicle Volumes a	nd Adjustn									
Major Street	<b></b>	Eastbound	T				Westbo	<u>und</u>		
Movement	1	2 T	3 R			<u>4</u> L	5 T			6
Volume	0	515	2		<b>-</b>	6	644			R 0
Peak-Hour Factor, PHF	0.81	0.81	0.81		<del></del>	0.87	0.87			).87 _
Hourly Flow Rate, HFR	0.07	635	2			6	740			0
Percent Heavy Vehicles	0	_				0	_		·	
Median Type				Undi	livided			1		
RT Channelized	<u> </u>		0							0
Lanes	0	1	0			0	1			0
Configuration			TR			LT				·
Upstream Signal		0					0			
Minor Street		Northbound					Southbo	und	-	
Movement	7	8	9			10	11			12
	L	Т	R			L	Т			R
Volume	1	0	6			0	0			1
Peak-Hour Factor, PHF	0.58	0.58	0.58			0.25	0.25			.25
Hourly Flow Rate, HFR	1	0	10			0	0			0
Percent Heavy Vehicles	0		0				0			0
Percent Grade (%)		0	<b></b>				. 0			
Flared Approach	<u> </u>	N					N	$\longrightarrow$		··
Storage		0					0			
RT Channelized			0						_	0
Lanes	0	0	0			0	0			0
Configuration		LR								
Delay, Queue Length, a	and Level of	Service								
Approach	EB	WB	1	Northb	ound	1	S	outhb	ound	
Movement	_ 1	4	7	8		9	10	1	1	12
Lane Configuration		LT		LR						
v (vph)		6		11						
C (m) (vph)		956		406	_					
v/c		0.01		0.03					•	
95% queue length		0.02		0.08						<del></del>
		8.8		14.		···				
Control Delay					<u>'</u>					<del></del>
LOS		Α .		B						
Approach Delay		<del></del>		14.						
Approach LOS	<u> </u>			В	<u></u>		L			

	TWO	-WAY STOP	CONTR	ROL SI	JMMARY	,		
General Informatio	n .		Site	Inform	ation	<del> </del>		
Analyst	JAG		Inters	ection		Orrs Mil	l /Jackson	<u> </u>
Agency/Co.	TMA .			diction	<del>***</del>		f Cornwall	
Date Performed	5/20/02			sis Yea	-		ensitivity	
Analysis Time Period	PM Peak	Hour						
Project Description Me	adowbrook	Estates						
East/West Street: Orrs			North	South S	treet: Jac	kson Avenu	ie	
Intersection Orientation:	East-West				hrs): 0.25			
Vehicle Volumes a	nd Adiustr	nents						
Major Street	1	Eastbound				Westbo	und	
Movement	1	2	7 3		4	5		6
	L	T	R		L	Т		R
Volume	13	108	3		2	172		163
Peak-Hour Factor, PHF	0.72	0.72	0.72	?	0.77	0.77		0.77
Hourly Flow Rate, HFR	18	149	4		2	223		211
Percent Heavy Vehicles	1	_			1			
Median Type				Undivid	led			
RT Channelized			0					0
Lanes	0	1	0		0	1		0
Configuration	LTR				LTR			
Upstream Signal						0		
Minor Street		Northbound				Southbo	und	
Movement '	7	8	9		10	11		12
	L.	Т	R		Ł	T		R
Volume	2	44	8		89	33		28
Peak-Hour Factor, PHF	0.81	0.81	0.81		0.83	0.83		0.83
Hourly Flow Rate, HFR	2	54	9		107	39		33
Percent Heavy Vehicles	0	0	0		5	5		5
Percent Grade (%)		10 .				-2		
Flared Approach	· <del></del> -	N				N		
Storage		0				0		
RT Channelized		1	0		<del> </del>			0
Lanes	0	1	0		0	1	<del>-   -</del>	0
Configuration		LTR	<del>                                     </del>	<del></del>		LTR	<del>-   -</del> -	
Delay, Queue Length, a	nd level of							
Approach	EB	WB		Northbou	ınd	S	outhboun	<del></del>
Movement	1	4	7	8	9	10		·
<del></del>			<del>'</del>		3	1 10	11	12
Lane Configuration	LTR	LTR		LTR		<del> </del>	LTR	<del> </del>
v (vph)	18	2		65		<del> </del> _	179	<b>_</b>
C (m) (vph)	1131	1434		427		<b></b>	435	<b></b>
v/c	0.02	0.00		0.15			0.41	<u> </u>
95% queue length	0.05	0.00		0.53	<u></u> _	<u> </u>	1.98	
Control Delay	8.2	7.5		14.9			18.9	1
LOS	A	Α		В			С	1
Approach Delay	-			14.9		<del>                                     </del>	18.9	<del></del> _
Approach LOS				B		<del> </del>	C	
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HCS2000<sup>™</sup>

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			НС	S2000	DET	AILE										
General Inform Analyst Agency or Co. Date Performed Time Period	JAG TMA 1 5/20/03 PM Peak Houl						Inte Are Jur Ana	ersecti ea Typ risdictio	e / on : Year , t	Route All oth Town Build	ner a of C Sign	& Jackso reas ornwall al Sensit rook Esta	ivity	Je		
Volume and Ti	ming Input		1	EB				WB		-1		NB		1 -	SB	
			LT	TH	RT	Lī		TH	RT	+	Ť	TH	RT	LT	TH	RT
Number of lane	s, N <sub>1</sub>		0	1	0	0		1	0	(	,	1	0	0	1	0
Lane group				LTR			1	LTR		$\top$		LTR	1		LTR	
Volume, V (vph	)		89	448	36	57	· [	521	65	7:	2	61	43	25	52	109
% Heavy vehicl	es, %HV		0	0	0	0		0	0	C	)	0	0	0	0	0
Peak-hour facto	or, PHF		0.87	0.87	0.87	0.8	6 (	0.86	0.86	0.8	34	0.84	0.84	0.92	0.92	0.92
Pretimed (P) or	actuated (A)		P	P	P	P		P	P	F	,	P	P	Р	P	P
Start-up lost tim	ne, I <sub>t</sub>			2.0				2.0				2.0			2.0	
Extension of eff	fective green, e			2.0				2.0	$\Gamma^{-}$	Τ		2.0			2.0	
Arrival type, AT	•			3		7		3				3			3	
Unit extension,	UE			3.0				3.0	1			3.0			3.0	<b>†</b>
Filtering/meteri	ng, I			1.000		$\top$	1	1.000	1			1.000		T	1.000	1
Initial unmet de	mand, Q <sub>b</sub>			0.0				0.0	1		•	0.0	<del>                                     </del>		0.0	
Ped / Bike / RT	OR volumes		0		0	0			0	0	)		0	0		0
Lane width				12.0			1	12.0	Ì			12.0			12.0	
Parking / Grade	arking / Grade / Parking			0	Ν	N		0	N	٨	,	-2	N	N	2	N
Parking maneu	vers, N <sub>m</sub>	•			<u> </u>								1			1
Buses stopping	, N <sub>s</sub>			0				0				0			0	
Min. time for pe	edestrians, G <sub>p</sub>			3.2				3.2				3.2			3.2	
Phasing	EW Perm	02		03		04	4		S Perm		_	06		07	0	3
Timing	G = 35.0 Y = 5	G = Y =		G = Y =	G = Y =				G = 15.0 $Y = 5$		G = Y =		G= Y=		G = Y =	<del></del>
Duration of Ana	r = 5 alysis, T = 0.25	<u> </u>				1 -						le Length		50.0		
	apacity, Contr	ol Delay	, and L	OS Deter	minat	іоп							·			
			E		Т.	· -	WB			17	_	NB			SB	Lor
Adjusted flow r	ate, v	LT	TH 658		╌┼╌	.T	TH 748	<del> -</del> -	RT	LT		TH 210	RT	LT	TH 202	RT
Lane group car			901		+		988	<del>-  -</del>				355		1	407	†
v/c ratio, X	, , , , , , , , , , , , , , , , , , , ,		0.73		+-		0.76	+	+		-	.59		†	0.50	<b>†</b>
Total green rat	io, g/C		0.58				0.58	<del></del>			-	.25		<del> </del>	0.25	<del> </del>
Uniform delay,		+	9.1		+		9.3	+				9.8		†	19.3	<del> </del>
Progression fa			1.00		十		1.000	,			1	.000		1 -	1.000	1
Delay calibration	on, k	+	0.50	,   -	_		0.50	十			d	.50		T	0.50	1
Incremental de	elay, d <sub>2</sub>	$\top$	5.2				5.4				+	7.1		1	4.3	<b>†</b>
Initial queue de																
Control delay			14.3	3			14.7				2	6.9			23.5	
Lane group LC	os		В				В					С			С	
Approach dela	Approach delay 14.3				14.	7			_	26.9				23.5	<del></del>	
Approach LOS	3		В	,".		В				С				С		
Intersection de	elay		16.9		1					Inters	section	n LOS			В	
HCS2000 <sup>TM</sup>				Copyrigh	t <b>©</b> 2000	Universit	y of Flo	orida, All	Rights Rese	rved						Version 4.1

Attachment E
REVISED FIGURE 10

